IOWA HIGHWAY RESEARCH BOARD
Minutes of June 27, 2003

Regular Board Members Present

J. Adam
L. Brehm
R. Ettema
T. Fonkert
R. Gould
L. Greimann
B. Keierleber
K. Mahoney
C. Marker
M. Nahra
G. Parker
J. Selmer
C. Van Buskirk

Alternate Board Members Present

J. Berger
G. Miller
A. Smith
R. Younie

Board Members With No Representation

D. Julius
J. Krist

Secretary

M. Dunn

Visitors

Leo Donnelly	*Buchanan County*
Ellen Gaffney	*Buchanan County*
Tyler Rasmussen	*Buchanan County*
Jenny Balis	*FHWA*
Sara Buseman	*Iowa Department of Transportation*
Ed Engle	*Iowa Department of Transportation*
Scott Marler	*Iowa Department of Transportation*
Mohammad Mujeeb	*Iowa Department of Transportation*
Ananto Prasetyo	*Iowa Department of Transportation*
Bob Steffes	*Iowa Department of Transportation*
James Cable	*Iowa State University*
Brian Coree	*Iowa State University*
Rosanne Edwards	*NNW, Inc.*
Steve Jacobsen	*NNW, Inc.*
Hosin "David" Lee	*The University of Iowa*

The meeting was held in the meeting room in the basement of the Nature Center Building at Fontana Park, south of Hazleton, Iowa in Buchanan County. The meeting was called to order at 9:00 A.M. by Dr. Rob Ettema.

Welcome

- Ellen Gaffney, Buchanan County Board of Supervisors, welcomed everyone to Fontana Park. She introduced Leo Donnelly, another Supervisor for Buchanan County. She then discussed some of the accomplishments involving research that the county has had under Brian Keierleber's lead, including the railroad flat car bridges. She also pointed out some of the highlights of the area and invited the group to tour Fontana Park and see the displays, the new electric car, and the animals, including the baby buffalo born earlier in June.

Agenda review/modification

- It was announced that the paving project which was going to be toured following the meeting was not yet underway. Mark Dunn suggested that an open house be planned for the Board once paving was started. Brian Keierleber made maps available of other project locations for anyone who wanted to tour other areas of interest on their own following the meeting. These projects included railroad flat car bridges, deck overlays, vegetable oil dust control, and a wetland area.

Approval of the minutes

- Charles Marker moved to approve the minutes from the May 30, 2003 meeting with no additions or corrections. Mark Nahra seconded. Carried with 11 yes, 0 no, and 0 abstaining.

Problem Statement, "Determination and Evaluation of Alternate Methods for Managing and Controlling Highway-Related Dust - Phase II - Demonstration Project"

- Dr. Brian Coree, Iowa State University, presented the background information done under the previous IHRB research project, TR-449, and the potential alternatives and recommendations derived from that research. He then presented the materials to be evaluated, the test locations, the research operation plan, the time frame and the budget of the proposed following stage of research.

- It was recommended that the research include comparing how the different methods work on roads with varying traffic levels; for example comparing a high traffic road, around 200 vpd, to a normal traffic level of around 50 vpd.

- There was a question about the higher and lower levels of sugar in different types of lignin and which would be used for this project. It was thought that the one with the higher level of sugar seemed to last longer. This question will be forwarded to the lead PI, Vernon Schaefer.

- The actual "product" from this research was discussed. It will be a comparison of dust generation and effectiveness compared to costs of currently used and newer types of dust control methods.

- The testing of the newer products, like soap stock, was mentioned as a key part of this research.

- It was suggested that this project have an advisory board made up of those familiar with the issues and products. Many county engineers have this type of knowledge.

- It was also recommended looking at the road stability, even if it is a subjective analysis. Using calcium chloride helps stabilize the road bed; while with lignin or a product that coats the surface, blading could destroy the effectiveness.

- The use of magnesium chloride was mentioned. It was recommended that if any of the current locations in Story County used magnesium chloride, that it may be advantageous to have a test run on that surface too.

- The level of staffing was questioned for the research activity being proposed. It was asked that salaries and wages for the PIs be re-evaluated prior to the proposal being submitted. Having an active advisory committee could help with some of the issues in lieu of additional project staff. An opinion that it could be done for closer to $100,000 was expressed.

- Charles Marker moved to approve the problem statement and have a proposal brought back to the Board with consideration given to the above recommendations. Mark Nahra seconded. Carried with 13 yes, 0 no, and 0 abstaining.

Problem Statement, "Effectiveness of Electrochemical Chloride Extraction for the Iowa Avenue Pedestrian Bridge"

- Steve Jacobsen, NNW, Inc., discussed the history, design, and plan for the bridge; the process of electrochemical chloride extraction; and objectives and aspects of the proposed research plan, including evaluation of existing concrete, monitoring and testing during extraction, analysis of the data, monitoring and testing during construction, time frame, budget and final report.

- This project has already started and is also being funded by the City of Iowa City, The University of Iowa and the Iowa Department of Transportation. The portion requested from the IHRB would be for the analysis of the system on a bridge deck with varying depths (nine inches to three feet deep). The main purpose of this research would be to see if this is an effective and economic process to remove chloride; then it could be assumed it could be taken to any bridge deck, laid down after the winter, and used to remove the chloride and stop the corrosion.

- It was recommended that similar research done in Canada and Virginia be looked at and considered during this project.

- It was clarified that the deck was taken down to the top layer of reinforcing steel; some steel was replaced and some was cleaned by sand blasting then was epoxy coated.

- The concern and feasibility of traffic on a bridge during the time frame of 8 weeks for the treatment was discussed. In other research done with this process, it was found that doing the treatment in stages to allow for one lane of traffic, or laying down steel plate for the traffic to pass over were both options.

- This process could also prove useful in the areas that barrier rails without corrosion protection on the steel were used.

- Due to the time frame of the project and the thorough problem statement submitted, the Board decided to treat the problem statement at a proposal level and vote on full approval of the research project.

- Christy Van Buskirk moved to approve the research project with the funding split of 80% Primary, 10% Secondary, and 10% Street. Kevin Mahoney seconded. Carried with 13 yes, 0 no, and 0 abstaining.

Interim Report TR-474, "Development of a Mix Design Process for Cold In-Place Rehabilitation Using Foamed Asphalt"

- Dr. Hosin "David" Lee, The University of Iowa, presented the research progress, the past efforts on foamed asphalt, the first and second round of mix design procedures, the test results and conclusions of the first round of tests, the changes made to do the second round of tests, and the preliminary conclusions of the second round of tests.

- It was requested that if anyone is doing a foamed asphalt project this summer, that Dr. Lee is contacted if it is possible for him to get samples of RAP material. The material would be stored until this project is done in the winter and with the intention of moving forward with further research at that time to test this design procedure on a wider variety of samples. Also with the intention of looking into the gyratory compaction procedure verses the Marshall compaction procedure.

- The importance of moisture content was discussed. In the field, it is difficult to control moisture content, it is not uniformly applied. It appears that the more moisture the better for highway construction, due to quick evaporation. The concern with that is how soon traffic will be on the pavement and curing time. Currently there is a project with Koch Materials comparing emulsion with foamed asphalt. A raveling testing was done; this is tied closely with moisture. The report on that subject can be made available through Dr. Lee after it is approved.

- No Board action was necessary.

Review of RFPs for 1st Solicitation for FY 03-04

Mark Dunn reviewed the RFPs written and any changes made to them since mailing out the Board packet CD, plus reasons for waiting on some of the other topics of the first 11 priority projects for FY 03-04.

- ***IHRB 03-1 Design Guide and Construction Specifications for NPDES Site Runoff Control***
  - The title had been changed to include *Site Runoff Control*.
  - There was also a paragraph added to include addressing all stages of project development from design through project completion.
  - The DNR has shown interest in being part of the advisory committee and may possibly have some funding available for training or other aspects. Mark Dunn has a meeting in mid-July to discuss this interest.
  - It was also mentioned that soil conservation and Iowa Municipal Utilities were also interested in being involved. With this involvement, the full scope will be more developed over the course of the next month.
  - It was agreed that the appropriate budget range was of $150,000 to $200,000.
  - The time frame was recommended to be 24 to 36 months.

- SUDAS will oversee the maintenance and updating of the Design Guide and specifications.
- The option of requesting phased output was mentioned. It could be helpful to have preliminary results that could be put into practice, shared at 12 and 24 months, with a final report after 36. This may help with keeping all the groups involved together with implementing the findings.
- Dr. Muste's current research TR-485, "Erosion Control for Highway Applications - Phase II: Development and Implementation of a Web-Based Expert System for Erosion and Sediment Control Measures" was mentioned. Mark Dunn has met with him to discuss this new topic. After there is an opportunity to look more closely at the two projects, they will be tied together to make the best use of the findings of TR-485.

• ***IHRB 03-2 Optimization and Management of Materials in Earthwork Construction***
- Mark Dunn mentioned the change to the third objective to read, "Guidelines should include provisions for optimizing the final earthwork quality, but should also consider the optimization of project cost." This is to clarify if the extra work and quality is worth the additional cost.
- No other comments were made.

• ***IHRB 03-3 Long Term Performance Evaluation of Iowa Concrete Pavements***
- There was an addition to the second objective to not only review the pavement management records but to also review any available project records, such as field books, material source approval reports, etc.
- There was also a paragraph added to break the research into two phases. The first phase will be a feasibility phase to see if the information is available on some of the older pavements enough to make conclusions and recommendations. The results of availability will be reviewed at that time and decide if the project should continue. It was decided that 6 months would be sufficient for phase one. The anticipated time for phase two was recommended as 12 months, for a total of 18 months for both phases.
- It was recommended that the budget range be $75,000 to $100,000. The amount would be for the overall project and it would be asked that the Principal Investigator show the budget divisions for each phase.

• ***IHRB 03-4 Modified Simple Abutments for Low-Volume Bridges***
- Mark Dunn requested a bit more clarification from the county engineers on this topic prior to development of the RFP. Mark Dunn will review the draft RFP that was submitted last fiscal year from Mark Nahra. It fell just below the cut off for solicitation, so was never sent.
- It was thought that the Oden Enterprises style sheet pile abutment and the New York style were addressed in the 02-03 draft RFP.
- As an addition, it was felt that the information for geopiers could possibly be adapted to low-volume bridges for abutments.
- This topic started with the sheet piling concept coming out of New York and the desire to test it, with having no bearing pile around the back wall. To see if an adequate bearing could be developed to support a bridge. Another aspect driving the research is the low-volume road bridge designs that have been developed (for example Klaiber - railroad flat car bridges) and developing abutment designs that can be pulled from a book and used with those types of bridges.
- There is more of a structural component, much less hydraulic.

• ***IHRB 03-5 Modification of the Iowa Culvert Hydraulics Software***
- The Board agreed that since LaDon Jones wrote the initial program for this, it seemed most economical and logical for him to do the modifications on it. Dr. Jones will be asked to

submit a proposal at the same time the other proposals from the first solicitation will be reviewed, in September.

- ***IHRB 03-6 Conversion of the Highway Needs Study Program to a PC Based Windows Environment***
  - The Secondary Road Fund Distribution Advisory Committee is going to be bringing their preliminary report and recommendation on the direction of the highway needs study within the next two months. By November, the ISAC Board should know the final decision. Due to the timing, this topic will be held until the second round of RFPs.

- ***IHRB 03-7 Evaluation of the Long Term Field Performance of Cold In-Place Recycling***
  - With the comments Mark Dunn had received during the early reviews, there was a change to the objective to include, "determine how the engineering characteristics of past CIR projects relate to those CIR projects constructed following changes in CIR technology and materials."
  - No other comments were made.

- ***IHRB 03-8 Alternative Replacement/Rehabilitation Methods for Small Span Structures***
  - Dr. F. Wayne Klaiber currently has a final report (TR-452, "Alternative Solutions to Meet the Service Needs of Low Volume Bridges in Iowa) that will likely be presented at the September IHRB meeting, which looks at what has been done in this area and where the gaps may still exist. It is recommended to hold this topic until after that report is reviewed and decide the next step and proper scope at that time.

- ***IHRB 03-9 Improving PCC Mix Consistency and Production Rate By Two Stage Mixing***
  - Bob Steffes, Iowa DOT Materials Office, has been in contact with some equipment manufacturers and there is one manufacturer that has something that is available for ready mix operations. There is a trip to St. Louis being arranged to see the equipment in operation. The tour group will likely include people from the DOT, PCC Center, PCC industry, and contractors. With the information that is collected on that trip, it could greatly help direct the scope of this research, so this will be held until after that time.

- ***IHRB 03-10 Validation of the AASHTO 2002 Pavement Design Guide Input Values for PCC and HMA***
  - This could have several phases due to amount that could be accomplished under this general description. Mark Dunn is working with a group at the DOT that is addressing the issues on priority. This will be held until after a more defined direction is decided.

- ***IHRB 03-11 Utility Cut Repair Techniques - Investigation of Improved Utility Cut Repair Techniques to Reduce Settlement in Repaired Areas***
  - There was a slight change to the second bullet item, which relates to both types of backfill that might be considered, natural backfill verses manufactured.
  - This is another topic that will be designed to be included in the SUDAS manual, so it will be maintained.
  - The anticipated budget was thought to be appropriate at $120,000.

Proposal, Evaluation of the Compensatory Wetland Mitigation Program in Iowa"

- Scott Marler presented the problem statement; background, including federal regulations, information from the National Research Council, and recent studies; research objectives; research plan; products and implementation; benefits, including the IHRB funding

demonstrating in-kind support to get EPA grant, results being easily transferable to counties and cities, and reduction in programming costs and increased efficiencies; time schedule; staffing; and budget.

- If a site "fails", it refers mostly to the acre requirement for that site at this time. There is, however, a mechanism needed to measure if the overall program is such that the sites are consistently providing the ecological benefits they should be, plus falling within the size requirements.

- The wetland concept in regards to construction was discussed. The best possible planning is applied to every project that comes through, however, it is not that simple to develop it; it is an unpredictable act of Mother Nature. They are very dynamic systems. Overall what is looked for is a trend. A better gauge may be 20 - 25 years.

- The species are the key. The right combination of the plants, soils and hydrology are the deciding parameters. It was requested that the final report more clearly address these factors.

- It was asked that "lack of compliance" and "failure" be defined more clearly in the final report.

- The goal of this overall research is finding out how the sites are truly performing and developing a sounding board for drawing those conclusions. The goal of the IHRB funding is to demonstrate in-kind support to get the EPA grant.

- Kevin Mahoney moved to approve the proposal with 100% Primary funding. Lyle Brehm seconded. Carried with 13 yes, 0 no, and 0 abstaining.

New Business
- None

Review of current research of interest
Bob Steffes, Iowa Department of Transportation, presented information on each of the following research projects.

- ***MLR-97-05, "Early Entry Sawed Portland Cement Concrete Transverse Joint Ends"***
  - The Draft Final Report was included on the Board packet CD for this Materials Laboratory Research (MLR). Bob Steffes presented the objectives; photos of the old and new systems; and results, including supporting charts and photos of the research. Standard Road Plan RH-51 will now include this procedure.

- ***MLR-02-03, "Portland Cement Concrete Curing Compound Performance - Phase I and Phase II"***
  - The Draft Final Report was included on the Board packet CD. Bob Steffes reviewed the objectives, information on performance under laboratory and field conditions, application rates and losses, Phase II research on field-testing, and conclusions of this project.

- ***HR-1079, "Improving PCC Mix Consistency and Production Rate By Two-Stage Mixing***
  - This research is in the early stages and had no paper report. Bob Steffes covered background information on this process from the oil industry, general questions and answers about

adapting this to pavements, and conclusions about the next steps of this research. This topic was one of the top priorities of the IHRB and the RFP was discussed earlier in the meeting. The RFP will be on hold until after the tour in St. Louis to see the equipment operation.

MLR-00-05, "Joint Former for Plastic Concrete"

- The Draft Construction Report was included on the Board packet CD.

- As was discussed earlier, Brian Keierleber offered to host an Open House that will be organized for IHRB members and alternates to attend after the paving using the joint former begins in Buchanan County. There may also be opportunities throughout the paving season for those who cannot attend to view a project using the joint former closer to their location.

- Bob Steffes started his presentation with giving information on a typical longitudinal joint and followed with the no sawing and no sealing benefits of the joint former ("Bob Sled"). He reviewed different versions of the joint forming knives, showed cores taken from the centerline formed joint, and discussed future research directions of the technology. Approximately 3,000' of joint was formed with this technology in 2001 and 150,000' in 2002. This year will be even higher.

- The idea of looking at transverse joint forming was also briefly mentioned.

Dr. Rob Ettema adjourned the meeting.

Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, JULY 25, 2003 AT 9:00 A.M. IN THE LARGE MATERIALS CONFERENCE ROOM AT THE IOWA DOT, CENTRAL COMPLEX, IN AMES, IOWA.

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Mark Dunn, IHRB Secretary